

What is claimed is:

1. A method of testing receiver sensitivity, dynamic range and other BER performance related measures in a frequency modulated transceiver incorporating a local oscillator shared between a transmitter and a receiver, said method comprising the steps of:
  - first applying a test sequence to a modulation input of said local oscillator so as to generate a modulated local oscillator signal therefrom;
  - second applying an unmodulated continuous wave (CW) radio frequency (RF) signal to an RF port of said transceiver, wherein the amplitude of said unmodulated CW RF signal is set to a desired test level;
  - mixing said unmodulated CW RF signal with said modulated local oscillator signal to generate an IF signal therefrom, said IF signal subsequently processed by said receiver; and
  - comparing data output of said receiver with said test sequence and generating a bit error rate (BER) result therefrom.
2. The method according to claim 1, wherein said step of mixing comprises the step of performing lower side injection.
3. The method according to claim 1, wherein said test sequence comprises a pseudorandom number (PN) sequence.
4. The method according to claim 1, wherein said unmodulated CW RF signal is provided by a low cost external RF generator.
5. The method according to claim 1, wherein said step of comparing comprises the step of correlating said receiver output date with said test sequence.
6. The method according to claim 1, wherein said unmodulated CW RF signal is generated using a second local oscillator within said transceiver.
7. The method according to claim 1, adapted to be implemented in an Application Specific Integrated Circuit (ASIC).
8. The method according to claim 1, adapted to be implemented in a Field Programmable Gate Array (FPGA).

9. An apparatus for testing receiver sensitivity in a frequency modulated transceiver incorporating a local oscillator shared between a transmitter and a receiver, comprising:

first means for applying a test sequence to a modulation input of said local oscillator so as to generate a modulated local oscillator signal therefrom;

second means for applying an unmodulated continuous wave (CW) radio frequency (RF) signal to an RF port of said transceiver, wherein the amplitude of said unmodulated CW RF signal is set to a desired test level;

means for mixing said unmodulated CW RF signal with said modulated local oscillator signal to generate an IF signal therefrom, said IF signal subsequently processed by said receiver; and

means for comparing data output of said receiver with said test sequence and generating a bit error rate (BER) result therefrom.

10. The apparatus according to claim 9, wherein said means for mixing comprises means for performing either lower side injection without compensation means or upper side injection with compensation means to correct spectrum inversion.

11. The apparatus according to claim 9, wherein said test sequence comprises a pseudorandom number (PN) sequence.

12. The apparatus according to claim 9, wherein said unmodulated CW RF signal is provided by a low cost external RF generator.

13. The apparatus according to claim 9, wherein said means for comparing comprises means for correlating said receiver output data with said test sequence.

14. The apparatus according to claim 9, wherein said unmodulated CW RF signal is generated using a second local oscillator within said transceiver.

15. The apparatus according to claim 9, adapted to be implemented in software residing in on-chip processing means.

16. The apparatus according to claim 9, adapted to be implemented in an Application Specific Integrated Circuit (ASIC).

17. The apparatus according to claim 9, adapted to be implemented in a Field Programmable Gate Array (FPGA).

18. An apparatus for testing receiver sensitivity in a frequency modulated transceiver incorporating a local oscillator shared between a transmitter and a receiver, comprising:

a sequence generator coupled to a modulation input of said local oscillator, said sequence generator adapted to generate and apply a test sequence to said local oscillator, said local oscillator adapted to output a modulated test signal in response thereto;

means for applying an unmodulated continuous wave (CW) radio frequency (RF) signal to an RF input of said receiver, wherein the amplitude of said unmodulated CW RF signal is set to a desired test level;

said receiver comprising a mixer adapted to mix said unmodulated CW RF signal with said modulated local oscillator signal so as to generate an IF signal therefrom, wherein said IF signal subsequently processed by said receiver; and

a bit error rate (BER) meter coupled to an output of said receiver and adapted to compare data output of said receiver with said test sequence to yield a bit error rate result therefrom.

19. The apparatus according to claim 18, wherein said mixer is adapted to perform lower side injection.

20. The apparatus according to claim 18, wherein said test sequence comprises a pseudorandom number (PN) sequence.

21. The apparatus according to claim 18, wherein said unmodulated CW RF signal is provided by a low cost external RF generator.

22. The apparatus according to claim 18, wherein said unmodulated CW RF signal is generated using a second local oscillator within said transceiver.

23. The apparatus according to claim 18, wherein BER meter comprises means for correlating said receiver output data with said test sequence.

24. The apparatus according to claim 18, wherein BER meter comprises means for determining whether the transceiver under test passes or fails based on said BER result.

25. The apparatus according to claim 18, adapted to be implemented in software adapted to be executed on on-chip processing means.

26. The apparatus according to claim 18, adapted to be implemented in an Application Specific Integrated Circuit (ASIC).

27. The apparatus according to claim 18, adapted to be implemented in a Field Programmable Gate Array (FPGA).

28. A method of testing receiver sensitivity in a transceiver chip incorporating a local oscillator (LO) shared between a transmitter and a receiver, test sequence generator and bit error rate (BER) meter, said method comprising the steps of:

setting said receiver to a receive mode of operation and enabling modulation of said local oscillator;

selecting the output of said test sequence generator as the data source for modulation of said local oscillator and tuning said local oscillator to generate a desired RF channel;

setting an external radio frequency (RF) generator to a desired frequency channel and power level;

resetting said BER meter and performing test sequence based error counting so as to generate a BER reading once complete; and

comparing a BER reading with a specified threshold and passing said chip if said BER reading is less than said threshold, and failing said chip otherwise.

29. A method of testing and characterizing receiver sensitivity in a transceiver chip incorporating a local oscillator (LO) shared between a transmitter and a receiver, test sequence generator and bit error rate (BER) meter, said method comprising the steps of:

setting said receiver to a receive mode of operation and enabling modulation of said local oscillator;

selecting the output of said test sequence generator as the data source for modulation of said local oscillator and tuning said local oscillator to generate a desired RF channel;

sweeping the amplitude setting of an external radio frequency (RF) generator over a predetermined range and measuring BER performance at a plurality of amplitudes;

generating a performance curve of BER versus input RF power level; and

passing said chip if said measured BER performance is better than a minimum specified performance, and failing said chip otherwise.

30. A method of testing the highest possible RF input level of a receiver in a transceiver chip incorporating a local oscillator (LO) shared between a transmitter and a receiver, test sequence generator and bit error rate (BER) meter, said method comprising the steps of:

- setting said receiver to a receive mode of operation and enabling modulation of said local oscillator;
- selecting the output of said test sequence generator as the data source for modulation of said local oscillator and tuning said local oscillator to generate a desired RF channel;
- setting an external radio frequency (RF) generator to a desired frequency channel and power level;
- resetting said BER meter and performing test sequence based error counting so as to generate a BER reading once complete; and
- comparing a BER reading with a specified threshold and passing said chip if said BER reading is less than said threshold, and failing said chip otherwise.

31. A method of testing the tolerance of a receiver to input frequency errors in a transceiver chip incorporating a local oscillator (LO) shared between a transmitter and a receiver, test sequence generator and bit error rate (BER) meter, said method comprising the steps of:

- setting said receiver to a receive mode of operation and enabling modulation of said local oscillator;
- selecting the output of said test sequence generator as the data source for modulation of said local oscillator and tuning said local oscillator to generate a desired RF channel;
- setting an external radio frequency (RF) generator to a desired power level and frequency channel with a deliberate frequency offset equal to the amount of error defined as tolerable in device's specifications and;
- resetting said BER meter and performing test sequence based error counting so as to generate a BER reading once complete; and
- comparing a BER reading with a specified threshold and passing said chip if said BER reading is less than said threshold, and failing said chip otherwise.